Nahant Marsh

Natural History of an Urban Marsh

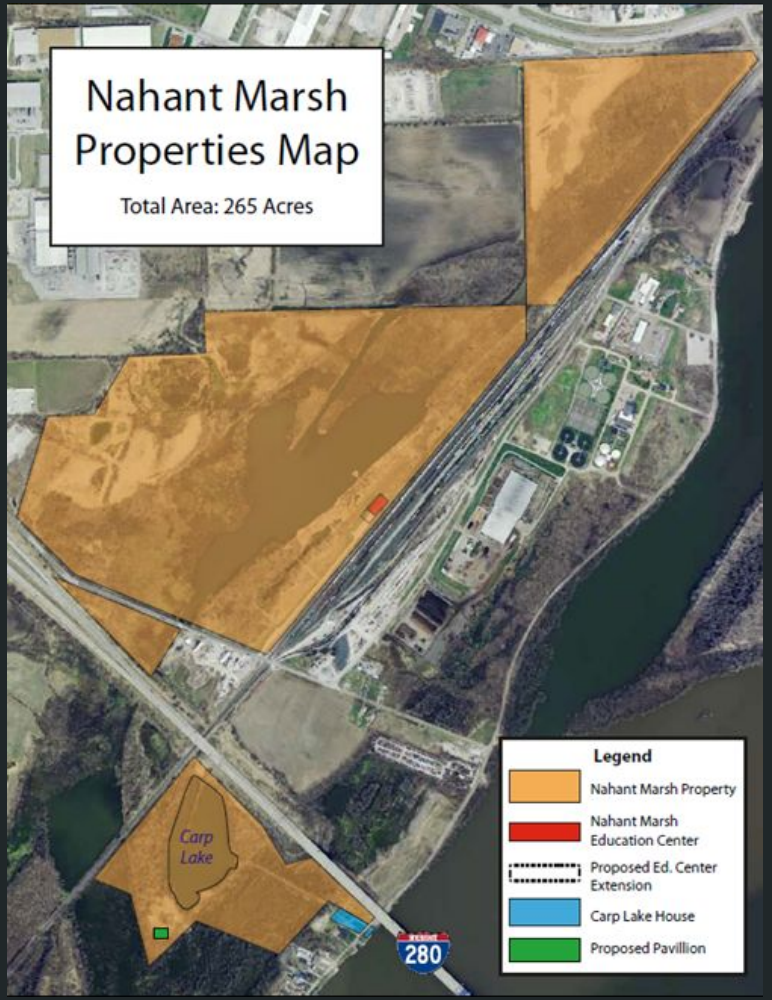
friends of NAHANT MARSH EDUCATION CENTER

General Information

- Nahant Marsh is a 305 acre wetland, adjacent to the Mississippi River
- Houses multiple wetland communities
  - Three predominant types here are
    - Bottomland Forest
    - Open-water habitat
    - Marshland
- Surrounding area includes suburban, industrial, as well as agricultural land

Borders of Nahant

- North: Highway 61
- East:
  - Northeast: railroad tracks
  - Southeast: Mississippi River
- South: Mississippi River
- West: Carp Lake



What Constitutes as a Wetland?

- Biotic Factors
  - Vegetative Cover (Wetlands Classifications and Types, 2017)
- Abiotic Factors (Brinson, 1993)
  - Hydrologic Controls
  - Geomorphic Controls
- General Definition

Hydrologic Controls

- Water inputs, Type of water flow, and Water Outputs (Grosselink and Turner, 1978)
  - Water Inputs
    - Capillary: Water drawn up from the ground through capillary action
    - Precipitation: Water from rain, snow, etc.
    - Upstream: Water coming from streams
    - Downstream: Water from flooded/dammed streams

Table 1
Major Hydrodynamic Characteristics of Freshwater Marshes[1]

	Raised-Convex	Meadow	Sunken-Convex	Lotic	Tidal	Lentic
Water Inputs						
Capillary	+	+				
Precipitation	+	+	+	+	+	+
Upstream		Little	+	+	+	+
Downstream					+	
Type of Water Flow						
Capillary	+					
Subsurface	+	+	+	+	+	+
Surface			Slow	+	+	+
Overbank				+	+	+
Water Outputs						
Percolation	+	+				
Evapotranspiration	+	+	+	+	+	+
Downstream		Little		+	+	+
Hydropulses	Seasonal	Seasonal	Seasonal	Seasonal	Tidal	Variable

[1] From Gosselink and Turner (1978).

Hydrologic Controls

- Water inputs, Type of water flow, and Water Outputs (Grosselink and Turner, 1978)
  - Types of Water Flow
    - Capillary: Water moving through capillary action
    - Subsurface: Water moving underground as part of the water cycle
    - Surface: Water moving over the surface as part of the water cycle
    - Overbank: Water moving due to flooding

Table 1
Major Hydrodynamic Characteristics of Freshwater Marshes[1]

	Raised-Convex	Meadow	Sunken-Convex	Lotic	Tidal	Lentic
Water Inputs						
Capillary	+	+				
Precipitation	+	+	+	+	+	+
Upstream		Little	+	+	+	+
Downstream					+	
Type of Water Flow						
Capillary	+					
Subsurface	+	+	+	+	+	+
Surface			Slow	+	+	+
Overbank				+	+	+
Water Outputs						
Percolation	+	+				
Evapotranspiration	+	+	+	+	+	+
Downstream		Little		+	+	+
Hydropulses	Seasonal	Seasonal	Seasonal	Seasonal	Tidal	Variable

[1] From Gosselink and Turner (1978).

Hydrologic Controls

- Water inputs, Type of water flow, and Water Outputs (Grosselink and Turner, 1978)
  - Water Outputs
    - Percolation: Water moving through soil
    - Evapotranspiration: Evaporation through plants performing photosynthesis
    - Downstream: Water Movement through streams and channels

Table 1
Major Hydrodynamic Characteristics of Freshwater Marshes[1]

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Water Inputs						
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Surface			Slow	+	+	+
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Water Outputs						
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Evapotranspiration	+	+	+	+	+	+
Downstream		Little		+	+	+
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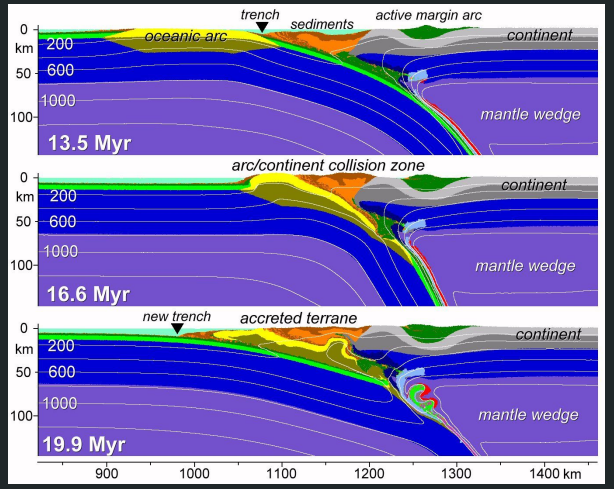
Geomorphic Controls

- Wetlands are formed through the movement of mass (Tooth et al. 2015)
  - This could be through:
    - Tectonic activity
    - Weathering
    - Erosion/Deposition
      - This was the main way Nahant was formed



Nahant Marsh Formation

- Formed from an Oxbow
  - River bends erode so much that loop is formed
  - Loop breaks off as water takes path of least resistance
  - Leaves behind crescent shaped meander which holds water and brings up any oversaturated groundwater

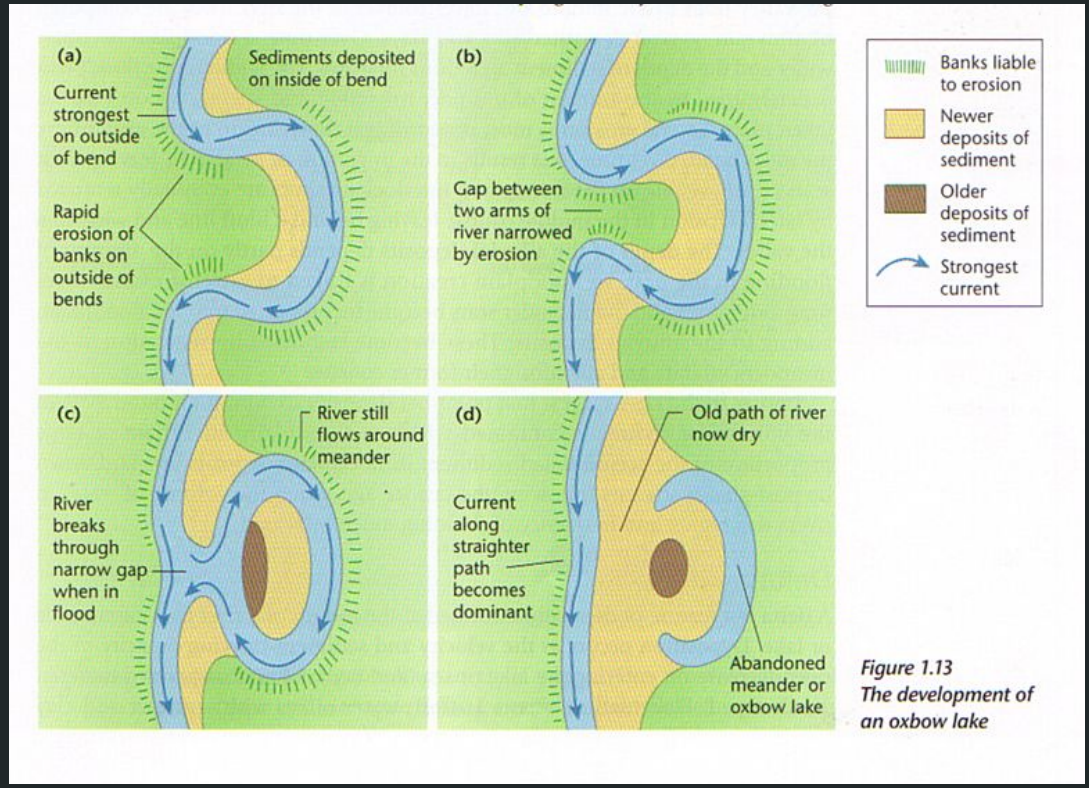


Figure 1.13 The development of an oxbow lake

Hydrogeomorphic (HGM) Classification

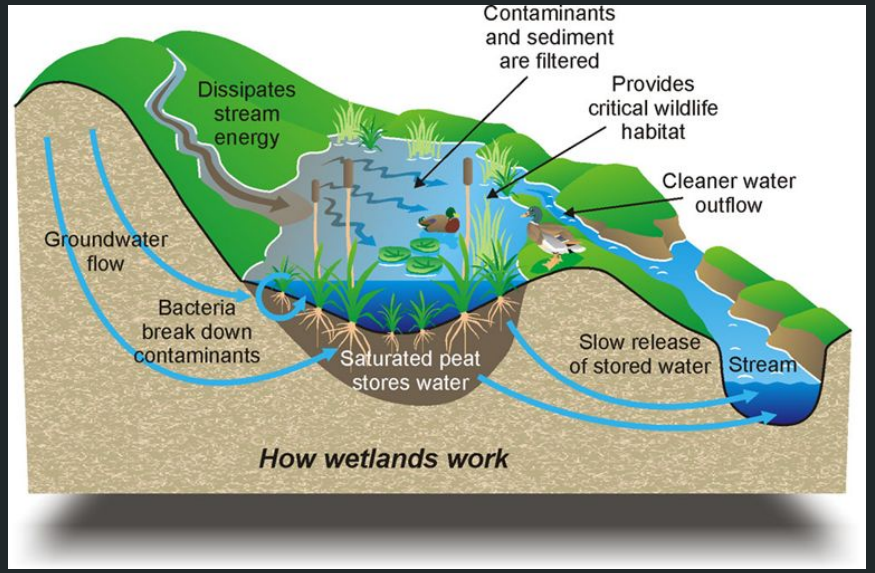
- Different types of wetlands
  - Riverine
    - Near the banks of a river
  - Slope depressional
    - Receive water from flooded lakes and sometimes rivers
  - Flat
    - Water runs over land very slowly
  - Fringe
    - Oversaturated water is pushed up from water table

General Classification of a Wetland

- Water-saturated for a minimum of 14 days during the growing season
- Hydric Soils
  - Soil permanently or seasonally flooded in which an anaerobic upper portion has formed (Hydric Soils: Introduction)
- Hydrophilic plant and animal species present

Importance of Wetlands

- Provide unique habitats
  - Provide food, water, resting and nesting areas
- Act as the Kidney's of the Earth
  - Filter water from streams, groundwater, and precipitation
  - Filter out pollutants and excess nutrients
    - Some Wetlands have been engineered to filter out pollutants
- Flood Control
  - Hold water to prevent flooding from high precipitation and snow melt
  - Prevents erosion from flooding by binding soil together



Nahant Flood Control

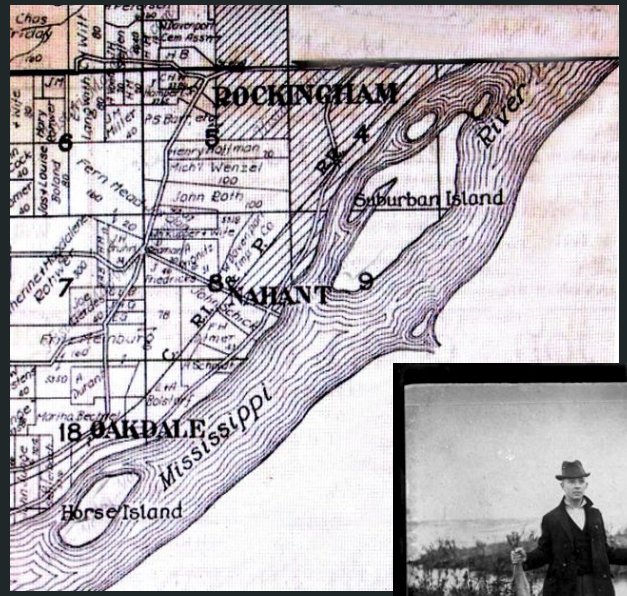
Nahant Flood Control

Four Main Categories

- Fens
  - Generally Northern areas, lower temperatures, short growing seasons, and runoff is main form of water
- Bogs
  - Form either by terrestrialization (Moss covers a pond or lake) or paludification (Moss prevents water from evaporating away)
- Swamps
  - Saturated soils during the growing season followed by periods of standing water
- Marshes
  - Receive water from surface sources, have soft stemmed vegetation, and saturated soils.
  - All seen at Nahant

History

- In 1835, Rockingham was founded where Nahant Marsh is today
- People would hunt and fish in the area
  - Caught Catfish between 150-170 pounds
  - So many prairie chickens, often given away for free
- Rockingham History
  - A large hotel was erected by the proprietors in 1836
  - A Ferry was established across the Mississippi river in 1837
  - In the summer of 1837, a steam saw and flouring mill was erected

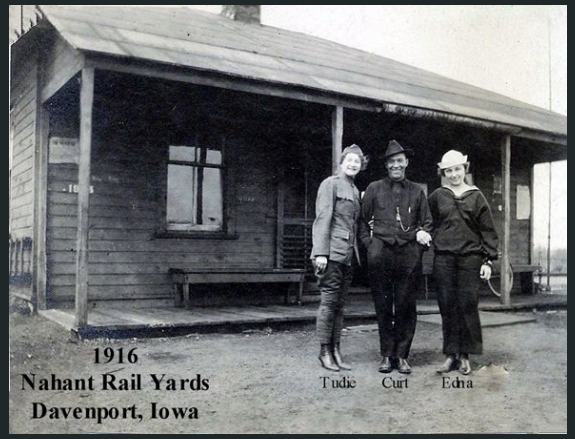


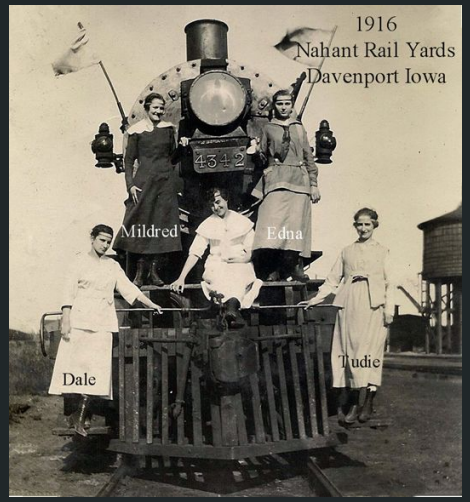
History

- A Methodist church was organized in 1836,
- In the fall of 1837 a small church of the Presbyterian order was organized.
- In 1840, an Episcopalian congregation was organized.
- All congregations worshipped, by turns, in a small church building
- It was also used as a school house.
- By 1838, Rockingham contained forty-five houses, including stores and workshops,
- By 1839, there were four dry goods and three grocery stores, besides a drug store and some whiskey shops. Mechanics of nearly all trades had settled there
- By 1848, Rockingham was abandoned due to continuous flooding

History

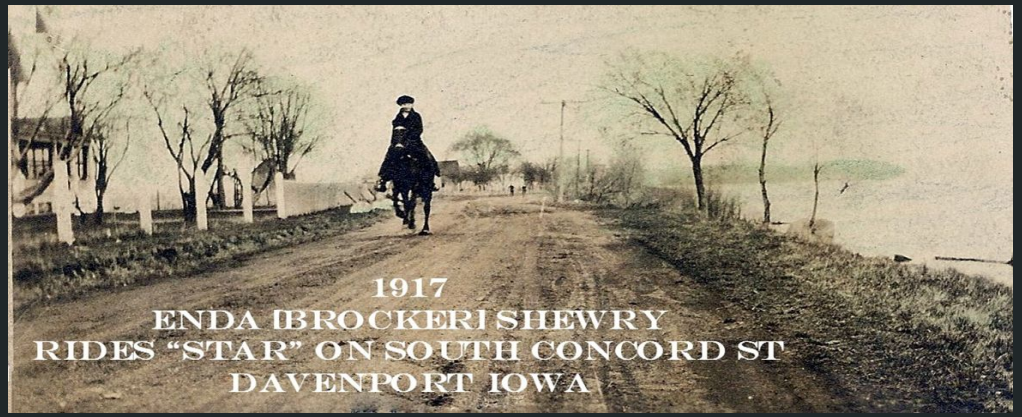
- A small town, Nahant was then founded
  - Nahant means “Land between rivers” in Algonquin
  - Considered an unlawful town
    - Brothels, taverns, and jazz

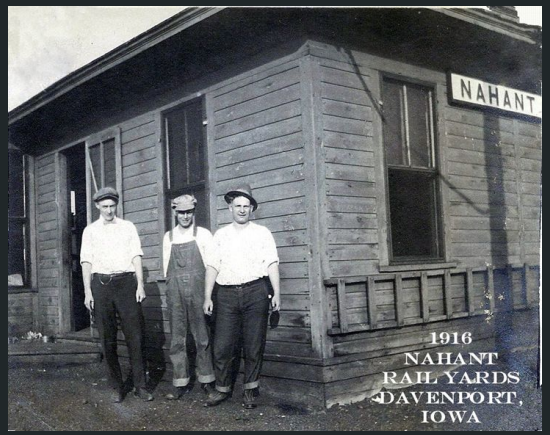




History

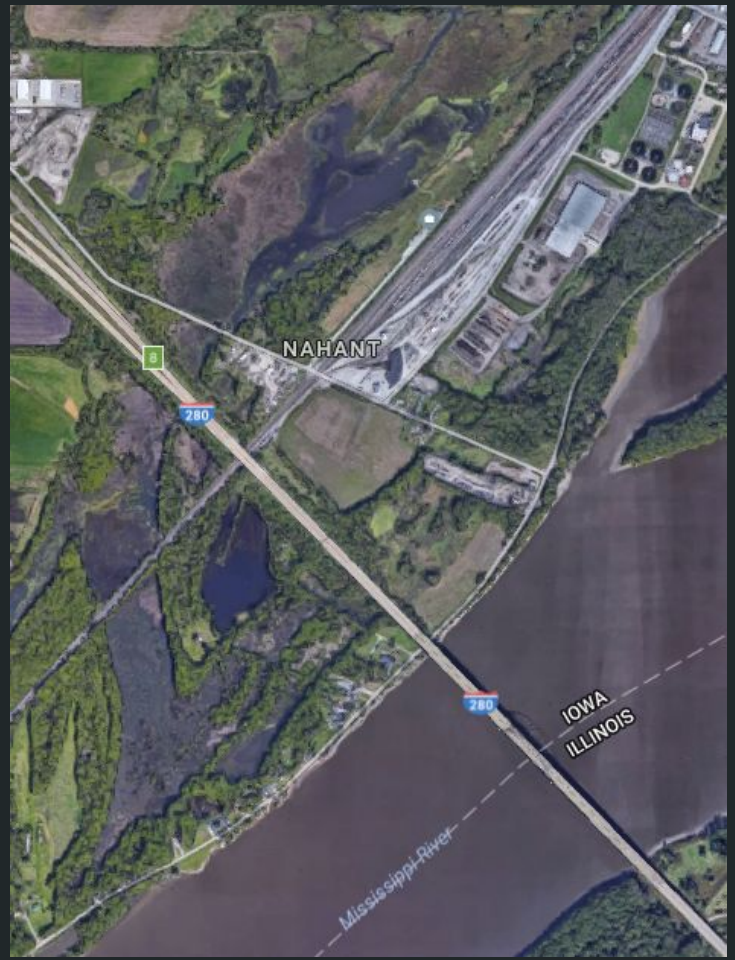
- (Grandma) Edna Brocker
  - Flirted with passing soldiers
  - Received a speeding ticket while on her horse, Star
- Robberies
  - One group of Bandits stole $55 and a watch from a hotel keeper
  - Large Train robbery occurred
    - Said that some treasure buried in Nahant to this day





History

- After the causeway built to Credit Island
  - River cut off from marsh
  - Extreme sedimentation occurred
- In the 1950's, Nahant was predominantly a Sedge meadow
  - Dominated by sedges and grasses
  - They have long periods of saturated soils, but tend to dry out during the growing season
  - Depends on inundation to replenish soil saturation



History: 1969-1996

- Scott County Sportsmen's Association
  - Shooting range for different types birds
  - One of the largest shooting ranges in the area
  - Shot lead bullets

History

- Lead Contamination
  - The lead bullets ended up in the marsh contaminating the water and harming the wildlife within it
  - Resulted in the closure of the Shooting Range

Shooting ranges are under fire

Lead shot over wetlands has poisoned some area waterfowl

By Ross Bielema
OUTDOORS WRITER

One Quad-City area shooting range has closed and another plans to close because lead shot is poisoning waterfowl.

The Fairport Izaak Walton League closed its trap range south of Muscatine, Iowa, this summer after the U.S. Fish and Wildlife Service determined that lead shot was falling into the Mississippi River.

Mike Coffey, a contaminants biologist for the U.S. Fish and Wildlife Service, Rock Island, said the Fairport range and the Quad-City Skeet and Trap Club in Davenport could be charged with killing waterfowl out of season if they continued shooting programs.

Lead pellets from shotgun shells have been proven to be toxic to certain species of waterfowl, he explained. Ducks and geese ingest lead pellets on the bottom of marshes or other waters as they seek small pieces of gravel for their gizzards. The gravel is needed to help grind and digest their food.

The lead then leaches into the bird's digestive system and bloodstream, resulting in death. This is why non-toxic steel shot is required for waterfowl hunting nationwide.

Fish and Wildlife Service officials have investigated similar problems at shooting ranges on the East Coast and in Wisconsin, he said. Only recently have they examined Iowa shotgun ranges that fire over rivers and marshes.

The Migratory Bird Treaty Act that protects waterfowl and other migratory birds does not distinguish between intentional and accidental killing of birds.

"If you struck down a duck (with your car), you would be violating the spirit of the law," he said.

The Davenport club is continuing its shooting programs, including skeet, trap, sporting clays and five-

Why not use steel shot?

Waterfowl hunters used to steel shot might ask: Why can't trap and skeet shooters use steel shot, too?

Quad-City Skeet and Trap Club member Duane Sossen said steel shot could damage expensive trap guns, because steel is so much harder than lead.

Many modern shotgun barrels are especially made to survive the use of steel shot. But trap and skeet shooters often use obsolete, collectible shotguns, or special shotguns not designed for steel shot.

Club president Tim Kelley noted that trap and skeet shooters often fire more rounds in a week than hunters fire in many seasons.

"It's nothing to shoot 500 rounds a weekend," he said.

Shooting that much steel shot could cause major damage to a firearm's barrel.

Steel shot and reloading components also cost more than double that of lead shot and components. Most club shooters reload their own ammunition to save money.

The U.S. Fish and Wildlife Service currently is seeking public comments on a plan to use bismuth-tin shot for waterfowl hunting next season.

Bismuth-tin shot currently is in use in Canada for waterfowl hunting, and appears to be non-toxic to waterfowl. Additional studies in the United States must be completed before it can be used here next year, however.

Club members said bismuth has a cost similar to

History

- Lead Contamination
  - The lead was taken up in the water by the cattails
    - Bottom Up Effect
      - Primary consumers would eat the cattails and become contaminated
      - They’re predators would eat them and in turn become poisoned from lead
      - Continued through to the top predators

History

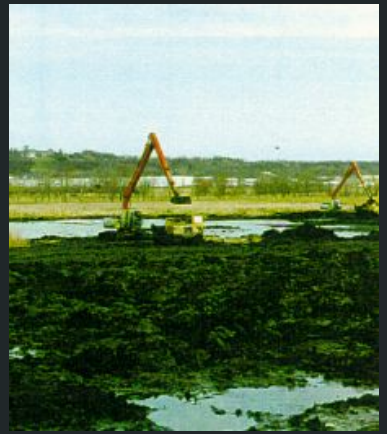
- EPA Superfund Site
  - In the 90's, board of Nahant Marsh was formed
    - Tasked to be stewards of the marsh
  - EPA spent millions to restore the Marsh
    - Dredged 13 acres of the marsh
    - 1 ft of soil was removed from the bottom of the marsh
    - These were done to reduce the amount of lead

History

- This was one of the largest EPA

  toxic federal land take up

History

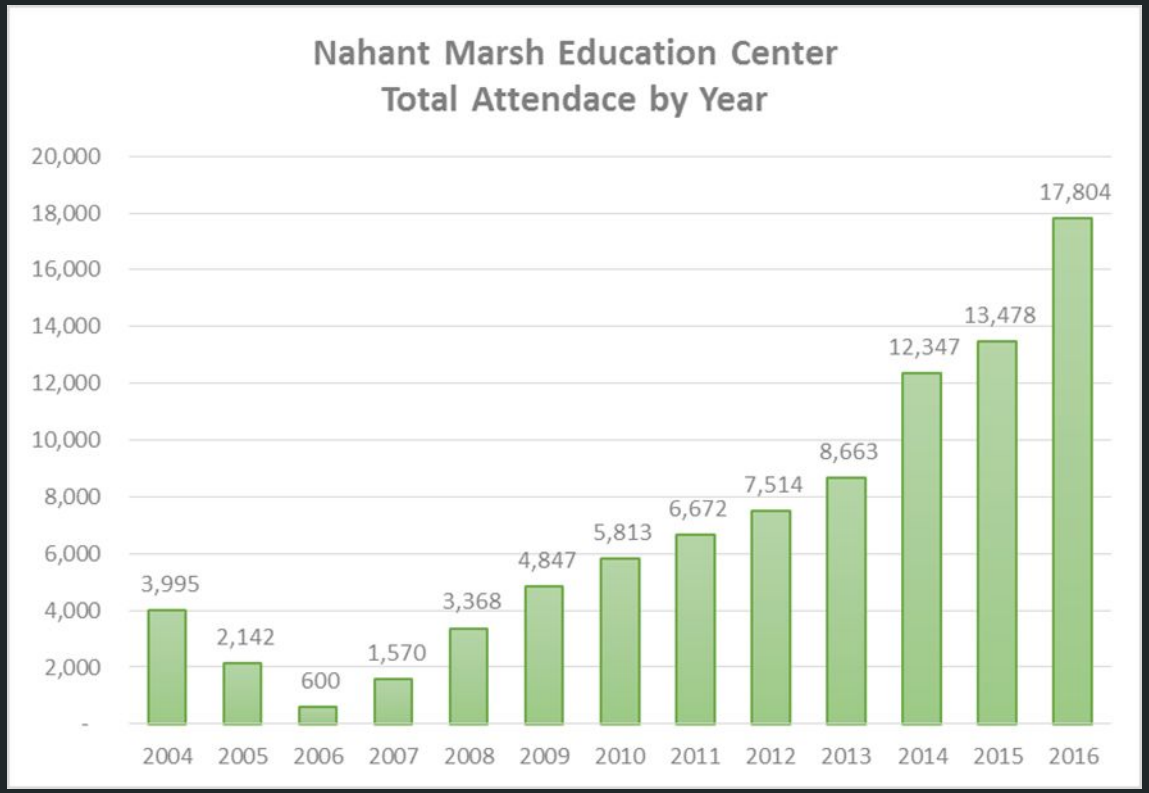


Nahant Today

- Largest Urban Wetland on the Upper Mississippi
- Education
  - Education Center Built in 2000
  - Partnership with Eastern Iowa Community Colleges Begins in 2007
    - Nahant Partners with multiple organizations to teach and maintain the marsh

Nahant Today

- Educational Center
  - *Mission: The mission of Nahant Marsh Education Center is to protect, enhance, and restore the Marsh through education, research, and conservation.*
  - *Vision: Our vision is to foster wonder, appreciation, and stewardship of the natural world.*


Nahant Marsh Education Center
Total Attendace by Year
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
-
3,995
2,142
600
1,570
3,368
4,847
5,813
6,672
7,514
8,663
12,347
13,478
17,804
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

Nahant Marsh

- I-280 bridge bisects the marsh which changes the composition of plant communities
  - Eastern side is marsh based
    - Cattails dominate
  - Western side is open water, emergent vegetation, and floodplain forest

Plant Life East of I-280

- Cattails
- River Bulrush
- Other species of Bulrush
- Sedges
- Rice Cut Grass

West of I-280

- Silver Maple

- Smartweeds

- Green Ash

- Slippery Elm

- Red-osier Dogwood

Plant Life West of I-280

- White Mulberry

- Bur Cucumber

- Riverbank Grape

Typical Sedge Meadow Species

- ❑ Swamp Milkweed
- ❑ Blue Joint Grass
- ❑ Common Lake Sedge
- ❑ Common Tussock Sedge
- ❑ Brown Fox Sedge
- ❑ Buttonbush
- ❑ Spotted Joe Pye
- ❑ Blue Vervain
- ❑ Saw-tooth Sunflower
- ❑ Obedient Plant
- ❑ Switchgrass
- ❑ Rice Cut Grass
- ❑ Dudley’s Rush
- ❑ Inland Rush

Typical Marsh Species

- ❑ Common Cattail
- ❑ Common Bur Reed
- ❑ Three Square
- ❑ Common Hop Sedge
- ❑ Brown Fox Sedge
- ❑ Rice Cut Grass
- ❑ Blue Flag Iris
- ❑ Blunt Spike Rush
- ❑ Needle Spike Rush
- ❑ Dark Green Rush
- ❑ Pinkweed
- ❑ Pickerel Weed
- ❑ Common Arrowhead
- ❑ Soft-stemmed Bulrush
- ❑ Hard-stemmed Bulrush

Typical Floodplain Forest Species

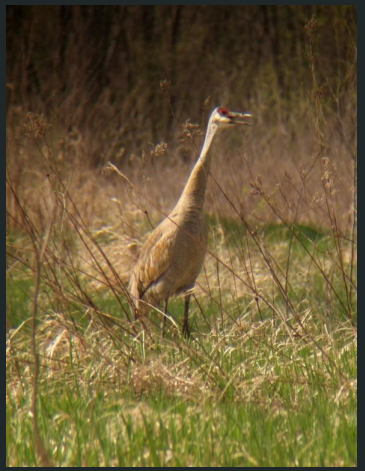
- ❏ Silver Maple
- ❏ Slippery Elm
- ❏ Hackberry
- ❏ Sycamore
- ❏ Green Ash
- ❏ Eastern Cottonwood
- ❏ Box Elder
- ❏ Red Maple
- ❏ Black Tupelo
- ❏ Black Willow
- ❏ Sandbar Willow
- ❏ Highbrush Cranberry
- ❏ River Birch
- ❏ Sweet Gum
- ❏ Red-osier Dogwood
- ❏ Swamp White Oak
- ❏ Pin Oak
- ❏ Burr Oak

Typical Floodplain Forest Species (Ground Cover)

- ❏ Wild Golden Glow
- ❏ Wingstem
- ❏ Skunk Cabbage
- ❏ Bur Cucumber
- ❏ Common Dodder
- ❏ Orange Jewelweed
- ❏ Yellow Jewelweed
- ❏ Wood Nettle
- ❏ Virginia Bluebells
- ❏ Giant Cane
- ❏ Fowl Manna Grass
- ❏ Riverbank Grape
- ❏ Poison Ivy
- ❏ Wood Sage
- ❏ Tall Nettle
- ❏ Virginia Creeper
- ❏ Common Wood Reed
- ❏ Sensitive Fern
- ❏ Stickseed
- ❏ False Nettle

Birds

- Believed to be over 170 species that use Nahant Marsh
- Approximately 75 species breed in Nahant
- 32% of bird species depend on wetlands for their life cycle
- Mississippi Flyway
  - Certain species use Nahant as a resting or staging area during migration

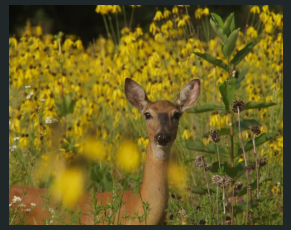


Types of Birds Present

- Waterfowl
- Wading birds
- Shorebirds
- Perching Birds
- Raptors

Mammals of Nahant

- White Tailed Deer
- White-footed Deer Mouse
- House Mouse
- Meadow Jumping Mouse
- Prairie Vole
- Meadow Vole
- Short-Tailed Shrew
- Masked Shrew
- Eastern Mole
- Star-nosed Mole
- Woodchuck
- Striped Skunk



Mammals of Nahant

- Coyote
- North American River Otter
- Racoon
- Virginia Opossum
- Fox Squirrel
- Rabbit
- Beaver
- Muskrat
- Big Brown Bat
- Little Brown Bat
- Northern Myotis
- Norway Rat

Mammals of Nahant

- ❏ Feral Dog
- ❏ Feral Cat
- ❏ Bobcat
- ❏ Red Fox
- ❏ Gray Fox
- ❏ Long Tailed Weasel
- ❏ Plains Pocket Gopher
- ❏ American Mink
- ❏ Eastern Mole
- ❏ Eastern Chipmunk

Amphibians of Nahant

- American Toad

- American Bullfrog

- Northern Cricket Frog

- Eastern Gray Tree Frog

- Northern Leopard Frog

- Western Chorus Frog

- Cope’s Gray Tree Frog

Reptiles of Nahant: Snakes

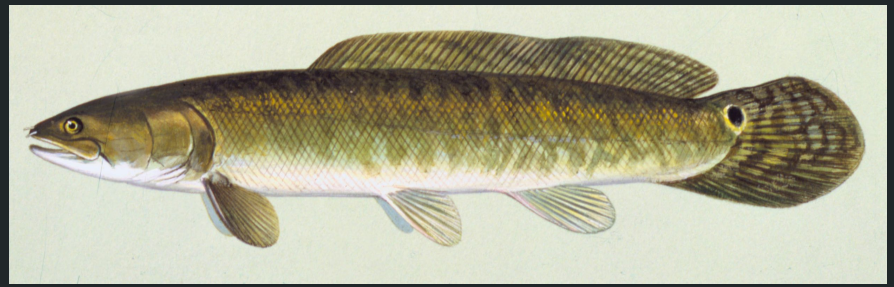
- Northern Water Snake
- Fox Snake
- Brown Snake
- Plains Garter Snake
- Eastern Garter Snake

Reptiles of Nahant: Turtles

- ❏ Spiny Softshell
- ❏ Western Painted Turtle
- ❏ Common Snapping Turtle
- ❏ Blanding's Turtle
- ❏ Red-Eared Slider

Fish of Nahant (Survey from 1996)

- ❏ Carp
- ❏ Bowfin
- ❏ Central Mudminnow
- ❏ Green Sunfish
- ❏ Bullhead



Pressures of Nahant Marsh

- Not enough land
  - Need a buffering area from outside pollutants
- Surrounding Land Use
  - Industrial Landfilling
  - Agriculture
  - Auto Fluff Site
    - Buried non-reusable car parts near Carp Lake
- Reduction of Biodiversity
  - Several rare species throughout the Marsh
- Irregular variation in seasonal water levels

How Can You Help?

- Connect With Nature
  - Enjoy our trails
- Volunteer
  - Local cleanups throughout the year
  - Prescribed burns
- Support
  - Come out and visit us at the Education Center
  - Enjoy the programs we host
  - Donate
- Call us at: 563-336-3370 or visit our website at www.nahantmarsh.org for more information on how you can help!

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